normal supply of DC electrical power from said first DC power source;

said power controller limiting the amount of DC electrical power from said first DC power source when said DC electrical power reaches a predetermined rechargeable limit; said rechargeable second DC power source providing any deficit in required DC electrical power; and

said power controller interconnecting said first DC power supply, a second DC power supply and said at least one load, for operation in three modes:

a first mode in which said first DC power supply provides all of the power for said at least one load;

a second mode in which said first DC power supply and said rechargeable second DC power supply share power to said at least one DC load; and,

a third, a mode in which said second DC power supply provides all the power for said at least one DC load means.

REMARKS

This is a Preliminary Amendment in conjunction with the filing of a Continuing Prosecution Application (CPA) of the above identified application, which is a continuation-in-part of application serial no. 08/606,219, filed March 7, 1996, now US patent no. 5,786,642 of July 28, 1998, which was a continuation-in-part of application serial no. 08/328,574,filedOctober 24, 1994, now US patent no.

5,500,561, which is was a continuation of application serial no.08/129,575 filed September 29, 1993, now abandoned, which was a continuation of application serial no. 07/944,796, filed September 15, 1992, now abandoned, which was a continuation of application serial no. 07/638,637, filed January 8, 1991, now abandoned. These applications are incorporated by reference herein.

This Amendment is also in response to the Final Office Action of April 12, 1999 and the references cited therein. In view of the amendments herein to the claims and the following representations, reconsideration of the application in its present form is respectfully requested.

First, prior allowance of Claims 4, 25-28, 29, 34, 35, 37-43 and 47 is noted. Claim 44, which depends from allowed Claim 43, is presumed to be allowable.

With respect to the remaining Claims, in view of the addition to old independent Claim 1 of new independent Claim 49, also in view of the amendment herein of Claims 1, 2, 3, 7, 9, 10, 16, 19, 22-24, 28, 30, 31, 34, 36, 45-46, and 48, and in further view of the addition of new Claims 50-113, it is respectfully submitted that the pending claims more particularly point out distinctly claim the method of the present invention.

Old Claim 1 has been amended to clarify the prior indefiniteness rejection. However, there is also the addition of new independent Claim 49 to attempt to answer the comments made by the examiner in the prior Final Office

Action of April 12, 1999 with respect to indefiniteness of old Claim 1. These comments of the Examiner in paragraph 1 of the Office Action appropriately focused on a deficit of clarity causing a vagueness and indefiniteness in old Claim 1. This indefiniteness has been clarified by the Amendment of old Claim 1 and the addition of new independent Claim 49.

Applicant concurs with this assessment of the prior Claims, especially old independent Claim 1, and has taken the steps to rectify this deficit.

Therefore, proposed new Claim 49 now captures the intent of Applicant to create a device that forms a universal building power interface that can accommodate the best of both the AC and DC power standards. New Claims 50-70 depend from new Claim 49.

In compliance with such correction of Claim 1 is the need to revise the subsequent dependent claims for better continuity and brevity.

For example, new Claim 49 now better answers the questions of the Examiner about what is meant by the voltage regulator receiving both the voltage and converted DC electrical power. It also clarifies what is meant by "voltage."

Furthermore, in conjunction with this clarification, Applicant adds new Claims with the three modes which are found in the circuitry of Figure 10, such as, for example, the AC input line, the alternative power source and the

storage battery and which are also described in allowed Claims 43 and 47.

For example, there is shown in drawing Figure 10 a PV voltage regulator circuit, a battery under voltage circuit, a voltage regulator and a power junction means controlling all three. The addition of these circuits into Claim 49 merely clarifies what is meant by the voltage regulation in old Claim 1.

Furthermore, since the versatility of the present invention is in its ability to operate in these three modes, it is not necessary to positively recite the actual storage battery or other DC power source. Therefore, they have been deleted from new Claim 49.

In addition, old Claim 1 has been amended to recite that the power controller has a first primary source of power, a second power control circuit for optionally connecting and maintaining a second power source, such as an external rechargeable storage battery, in readiness for service to the load, and a third power control circuit for optionally connecting and proportionately combining a third power source, such as, for example, an external alternative DC power source with the primary AC or DC power source.

Amended Claim 1 also provides that in the absence of the primary AC or DC electrical power source, the power controller combines power from the second power source and the third power source. Amended Claim 1 also recites that the power controller includes a third power control circuit

for proportionately combining one or more external power sources in service to the lighting fixtures and/or the optional storage battery. The Claims which depend from Claim 1 have been amended accordingly.

No new matter is added by the foregoing amendments. All of the new material is supported in either the specification and drawings of this application, or in the parent applications filed under Applicant's co-pending applications, now US patent no 5,500,561 and US patent no 5,786,642.

For example, Figure 10 shows compatible DC loads at the output. Also the connection circuitry is shown in Figure 10 at the power junction box of the diagram, as well as the junction at diodes 50 and 52 of Figure 3 of US patent no. 5,500,561, as well as the junctions J1, J2 of Figure 4 and junction at A of Figure 2 of US patent 5,786,642. Figure 2 therein shows various DC sources and connecting circuitry thereto, including secondary power connecting circuitry of Claim 50.

With respect to the storage battery being an electrical storage medium in the Claims, and the alternative DC power source being an optional source capable of providing DC, Figure 4 of US patent no. 5,786,642 discloses "other DC sources".

The photovoltaic connection of the Claims is disclosed in Figures 5, 6 and 10 of the above identified application.

The co-generator assisted power system of the Claims is disclosed in the discussion of Figure 11 at page 8 of the specification of the above noted application. The feature of the Claims that the primary source of power is AC or DC and that the secondary source is any DC source is disclosed clearly in Figure 10 of the above identified application. Also the voltage regulation feature noted is also disclosed clearly in Figure 10 of the above identified application.

Moreover, the 60Hz inverter of the Claims is disclosed in Figure 2 of US patent no. 5,500,561 and in Figure 3 of US patent no. 5,786,642.

With respect to the rejection under 35 USC 103 based on obviousness, in view of the amendments herein to the Claims, it is respectfully requested that the rejection of Claims 1, (and now new Claim 49) 2, 7, 9, 11, 13-16, 19, 22-24, 28, 30-33, 36, 45 and 46 under 35 U.S.C. 103 as being unpatentable over the combination of U.S. Patent No. 4,075,504 of Gnaedinger and U.S. Patent No. 4,988,889 of Oughton, or Gnaedinger '504 and Oughton '889 together with US patent no. 4,349,863 of Peterson, should be withdrawn. This rejection is respectfully traversed.

First Oughton '889 describes a "low power" oriented power source not a high power building oriented power source. Oughton '889 addresses lighting for such low capacity applications as "EXIT" signs, not area lighting in buildings. The application power levels with Oughton '889, such as "AA" DC batteries, as noted at column 2, lines 24-

25, are in the order of a few watts, in contrast to the hundreds and thousands of watts associated with the present invention.

Further note that the regulator in Oughton '889 is not a voltage regulator. It is designed to provide constant current (providing approximate constant power) not constant voltage, as with the present invention. See Abstract of Oughton '889 therein, at lines 3 and 4 and lines 7-10, column 1, lines 42-49, column 2, lines 17 and column 2, lines 28-29.

This means that Oughton's voltage can change in support of a device that may have dynamic changes in resistance. This is necessary to satisfy the specific type of solid-state light source, such as a light-emitting diode (LED), required in the Oughton '889 application.

Furthermore, the circuit in Oughton '889 is dependent upon the characteristics of a light emitting diode which benefits from a constant current source, not a constant voltage source. See column 2, line 17 of Oughton '889.

As a flyback regulator Oughton '889 would not be suitable or practical for the power levels implied with the present invention's application domain or device.

In contrast, the present invention uses a constant voltage device to support the ideal voltage state of a fully charged rechargeable battery that is essentially in parallel with and after the voltage regulator in a mode for longest battery stand-by life. The present invention's system

intrinsically provides for charging the battery as required by its constant regulated voltage relative to that battery state of charge voltage until a "float potential" is reached at the battery.

Oughton '889, in contrast, incorporates a battery before the regulator and does not provide a means for charging it, therefore, does not treat it as an integral part of the system as does the present invention.

Also, the technical details of Oughton '889 are quite different from the system of the present invention, which does not use a "flyback converter" as its voltage regulator. This element 12 is the specific type used in Oughton '889. Nowhere in Oughton '889 is the term "voltage regulator" used.

Far from being a general type of voltage regulator, it has auxiliary purposes such as "operating in current limited mode" (see lines 31/32 in column 4 of Oughton '889). Secondly, it appears that Oughton's converter is simply used for feeding into a buck/boost converter 14, which actually powers the load at all times, even when primary AC power is not available. In the present invention, however, there is no secondary buck/boost converter between the battery and the load.

Furthermore, Oughton '889 is not a high efficiency lighting source with incidental emergency back-up; it is a specialized power source for emergency lighting such as LED's which are being supplied constant power in a varying

voltage environment, such as when the battery source is being deeply discharged. The present invention does not unction in this manner.

Moreover, the Examiner's reasoning that "the purpose of providing substantially constant output power to the loads so as not to damage the load with improper voltages" neither fits Oughton '889 nor the present invention in their respective use of voltage regulators.

For example, in the system of the present invention, the voltage regulator is used to keep the battery charged and also by varying the voltage slightly, to effect power sharing among the various DC sources with the AC input. There is little notion of providing constant power output or filtering out damaging voltages. The "constant power output" is the main objective of the buck/boost converter (not the "voltage regulator" 12) in Oughton '889.

Concerning the rejection based upon the combination of Oughton '889 in view of Gnaedinger '504, it is noted that Oughton '889 should not be cited as noted above. Furthermore, Gnaedinger '504 does not produce voltage regulated DC electrical power.

For example, unlike the present invention, Gnaedinger `504 describes a power supply apparatus for a recreational vehicle which does not filter or voltage regulate the DC power derived from the AC connection.

In contrast to the present invention, Gnaedinger `504 is concerned with the rating of the transformer therein so

as to create a priority between the loads L1-L4 and charging the DC battery. In periods of high demand, the battery charging is interrupted.

Also in Gnaedinger `504, the loads L1-L4 can use full wave rectified AC unfiltered (these loads may be incandescent lamps or motor loads, not fluorescent lamps).

Furthermore, in Gnaedinger `504 load L5 is a special load requiring pure DC power which is handled separately.

In addition, in Gnaedinger `504 the battery is disconnected from loads L1-L4 during AC connection by using a relay.

Moreover, in Gnaedinger `504, the circuit is quite inefficient and is not adaptable for high efficiency lighting in offices.

Also, the network of the present invention is different from Peterson. In the present invention's system each controller has its own rechargeable DC power source. In Peterson, it is centrally located and shared. Furthermore, Peterson uses high voltage (i.e. 120 volts) AC or DC that is distributed to each lamp ballast in contrast to the system of the present invention, wherein each ballast requires low voltage DC. No high voltage AC is distributed to the DC lighting ballasts of the present invention.

Therefore, in light of the foregoing amendments to the Claims and the foregoing remarks, the rejection of the pending Claims under 35 USC 103 is requested to be withdrawn.

Applicant submits that the application is in condition for allowance, which allowance is earnestly solicited.

Respectfully submitted,

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